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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Timo Saamimo

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06/25/2007

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EXAMINER

PAN, YUWEN

ART UNIT

PAPER NUMBER

2618

MAIL DATE

DELIVERY MODE

06/25/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/769,851	Applicant(s) SAARNIMO, TIMO	
	Examiner Yuwen Pan	Art Unit 2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

DETAILED ACTION

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-7, and 10-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itakura et al (US006278873B1) in view of Brady et al (US006100804A).

Per claim 1, Itakura discloses a wearable device (see figure 2) comprising:

One or more circuit substrates comprising electrically conductive parts being disposed in at least a first plane (see figure 1 and item 9);

A radio unit operating at a radio frequency (see figure 1 and item 15);

A loop antenna coupled to the radio unit (see figure 2 and item 15 and 24), the loop antenna comprising a conductor formed into a loop defining an area and being disposed in a second plane; wherein the electrically conductive parts of at least one of said one or more circuit substrates substantially act as a ground plane (see figure 2 and item 14) causing a ground plane effect for the loop antenna and such that at least the electrically conductive parts of said at least one circuit substrate are within said area defined by the loop when observed in plan view minimizing the ground plane effect of the electrically conductive parts of said at least one

Art Unit: 2618

circuit substrate on the loop antenna (see column 5 and lines 43-67), and wherein said first plane is substantially coplanar with said plane (second conductor, item 24, part of the antenna structure coplanar with circuit substrates, item 14, as the second plane).

Itakura doesn't expressly teach that the loop antenna consisting of a single loop formed. Brady teaches that there are various type of antenna structure for a resonant antenna, between a single plane loop antenna and multi-loop antenna, the single plane loop antenna is preferred over the multi-loop (see column 7 and ^{line}40-48). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Brady with Itakura's device such that in term of antenna design for miniature device such as watch, a single loop plane antenna is preferred in order to reduce the overall thickness of the antenna.

Per claim 2, Itakura further discloses the radio unit is mounted on one of said one or more circuit substrates (see figure 1 and item 15).

Per claim 3, Itakura further discloses that said at least one circuit substrate (figure 2 and item 14) is positioned entirely within the area defined by the loop, when said at least one circuit substrate and the loop are observed perpendicularly with respect to the second plane.

Per claim 4, Itakura further discloses that the loop antenna is formed on the periphery of said at least one circuit substrate (see figure 2 and item 24 and 14).

Art Unit: 2618

Per claim 5 -7, Itakura further discloses that the loop antenna is coupled to the radio unit via balancing means in which comprises a balancing transformer and conduct between the radio unit and antenna (see figure 1 and items 23a, 24a and 25).

Per claim 13, Itakura further discloses at least one circuit substrate is a printed circuited board (see figure 1 and item 14).

Per claim 14, Itakura further discloses that the radio unit comprise a radio receiver and/or a radio transmitter (see column 6 and lines 22-27).

Per claim 16, Itakura further discloses the wearable device comprises a display unit (see figure 1 and item 13).

Per claim 17, 18, Itakura further discloses the wearable device comprises a watch circuit with computer function (see figure 1 and item 14).

Per claims 10, 11, Itakura further discloses that the loop antenna is coupled to the radio unit via balancing means in which comprises a balancing transformer and conduct between the radio unit and antenna (see figure 1 and items 23a, 24a and 25).

Art Unit: 2618

Per claim 12, Itakura doesn't disclose the detail about the length of the conductor of the loop antenna is substantially equal to a wavelength corresponding to the radio frequency that the radio unit operates at.

Asano discloses that the length of the conductor of the loop antenna is substantially equal to a wavelength corresponding to the radio frequency that the radio unit operates at (see column 2 and lines 49-60).

It would have been obvious to one ordinary skill in the art at the time the invention was made to combine the teaching of Asano with Itakura's device such that the effective antenna is maximized.

Per claim 15, Itakura doesn't disclose the radio unit comprises a GPS receiver. The examiner takes "Official Notice" that is notoriously well known in the art to utilize a GPS receiver in order to assist the user to locate the present location.

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to have a GPS receiver to assist the user to locate the present location.

Per claim 19, Itakura doesn't disclose the wearable device comprise a wristwatch housing of electrically non-conducting material. The examiner takes "Official Notice" that is notoriously well-known in the art to have non-conducting material for wristwatch housing in order to resist water or reduce interference with the radio unit.

Art Unit: 2618

It would have been obvious to one ordinary skill in the art at the time invention was made to utilize the non-electrical conducting material with Itakura's device such as plastic material to resist water and reduce interference with the radio unit within the housing.

4. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itakura et al (US006278873B1) and Brady et al (US006100804A) as applied to claim 1 above, and further in view of Bolanos et al (US005926144A).

Per claim 8, combination of Brady and Itakura does not teach said at least one circuit substrate and the second plane have a maximum vertical distance of about 0.1 times a wave length corresponding to the radio frequency that the radio unit operates at wherein the vertical distance is measured perpendicular to the second plane. Bolanos et al discloses that at least 1.8 mm (≥ 1.8 mm) is needed between two planes at an operating frequency of 930 MHz (see column 4 and lines 30-45). The wavelength of 930 MHz is about 3 cm. Based on applicant's claim, the maximum vertical distance should be 3mm at an operating frequency of 930 MHz. It is within the range of at least 1.8 mm in which is asserted by Bolanos and the distance between the two planes is adjustable according to the manufacture.

It would have been obvious to one ordinary skill in the art at the time the invention was made to combine the teaching Bolanos with Itakura such that a suitable distance between the planes is set to maximize the effect of antenna.

Per claim 9, Bolanos further discloses the loop antenna is coupled to radio unit via a balancing mean at two separate points located substantially 45-180 degree apart from each other

Art Unit: 2618

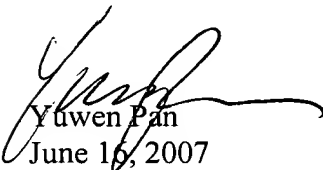
on the conductor loop of the loop antenna with respect to the center of the conductor loop in order to enable the use of circular polarization (see column 4 and lines 50-65).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuwen Pan whose telephone number is 571-272-7855. The examiner can normally be reached on 8-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anderson D. Matthew can be reached on 571-272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Yuwen Pan
June 16, 2007